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IS 4723 (1978): Egg Powder [FAD 18: Slaughter House and Meat Industry]

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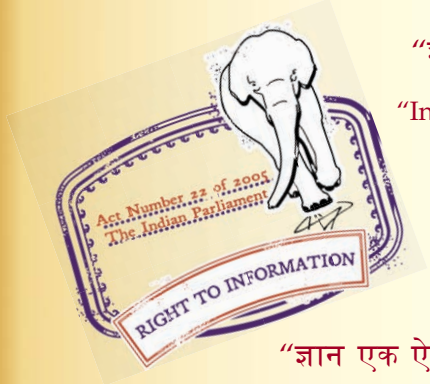

"ज्ञान एक ऐसा खजाना है जो कभी चुराया नहीं जा सकता है"
Bhartṛhari—Nītiśatakam
"Knowledge is such a treasure which cannot be stolen"

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Indian Standard

SPECIFICATION FOR EGG POWDER

(First Revision)

UDC 637 .41

INDIAN STANDARDS INSTITUTION
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI 110002

March 1979

Indian Standard

SPECIFICATION FOR EGG POWDER

(First Revision)

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AMENDMENT NO. 1 JULY 1983

TO

IS:4723-1978 SPECIFICATION FOR EGG POWDER

(First Revision)

Alteration

[*Page 6, Table 1, col 3, against Sl No.*(xii)] - Substitute '50' *for* '100'.

(AFDC 18)

Reprography Unit, ISI, New Delhi, India

AMENDMENT NO. 2 APRIL 2011
TO
IS 4723 : 1978 SPECIFICATION FOR EGG POWDER

(First Revision)

[*Page* 5, *clause* **4.2**(c)] — Substitute 'Net quantity of the contents;' *for* 'Net mass of the contents;'.

[*Page* 5, *clause* **4.2**(g)] — Substitute the following for the existing:

'g) Any other marking required under the *Standards of Weights and Measures (Packaged Commodities) Rules*, 1977, and the *Prevention of Food Adulteration Act*, 1954 and the Rules framed thereunder.'

(FAD 18)

Reprography Unit, BIS, New Delhi, India

Indian Standard

SPECIFICATION FOR EGG POWDER

(First Revision)

0. FOREWORD

0.1 This Indian Standard (First Revision) was adopted by the Indian Standards Institution on 16 October 1978, after the draft finalized by the Meat Industry Sectional Committee had been approved by the Agricultural and Food Products Division Council.

0.2 The demand for egg powder is increasing considerably both from the civilian population and from the defence personnel. Moreover, the technological details pertaining to its manufacture have been worked out fully at the Central Food Technological Research Institute, Mysore. This standard is being formulated in order to ensure that the production of egg powder is up to a quality level that is acceptable to the consumers and feasible for the manufacturers

0.3 This standard was first published in 1968. The present revision was undertaken mainly with a view to aligning this standard with ASC specification for egg powder. Consequently, this standard incorporates some of the additional requirements like boric acid, total ash, acid insoluble ash, organic phosphorus pentaoxide (P_2O_5) and *Salmonella*. Besides, the requirement for *p*H has been deleted and the method for determination of solubility has been modified

0.4 In the preparation of this standard, due consideration has been given to the provisions of the Prevention of Food Adulteration Act, 1954, and the Rules framed thereunder. However, this standard is subject to the restrictions imposed under this Act wherever applicable.

0.5 In the preparation of this standard, considerable assistance has been derived from the following publications:

CFS 2 3-1 B Eggs, dried Commonwealth Food Specifications, Commonwealth of Australia.

ASC Specification No. 57 Egg powder (spray dried). Director of Supplies and Transport, Army Headquarters. Ministry of Defence, Government of India.

0.6 This standard contains clauses **4.1.2, 4.2** and **E-2.3,** which call for an agreement between the purchaser and the supplier at the time of placing orders.

0.7 For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test or analysis, shall be rounded off in accordance with IS : 2-1960*. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

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1. SCOPE

1.1 This standard prescribes the requirements and the methods of sampling and test for egg powder.

2. TERMINOLOGY

2.0 For the purpose of this standard, the following definition shall apply.

2.1 Egg Powder — The product prepared under hygienic conditions from the liquid contents of sound, wholesome, hens' eggs by any recognized method of spray drying.

3. REQUIREMENTS

3.1 Hygienic Requirements of Processing Unit — The material shall be prepared and handled under strict hygienic conditions by persons free from contagious and infectious diseases and only in premises maintained in a thoroughly clean and hygienic condition and having adequate and safe water supply (*see* IS : 2491-1972†), and duly approved and licensed by the public health authorities concerned. All workers shall use clean and washed clothings. Necessary precautions shall be taken to prevent incidental contamination of the product from soiled equipment or from personnel suffering from injuries.

3.1.1 All equipment coming in contact with raw materials or products in the course of manufacture shall be kept clean. An ample supply of steam and water, hoses, brushes and other equipment necessary for proper cleaning of machinery and equipment shall be available. The equipment may be sterilized by immersion in or swabbing with hypochlorite solution or other suitable chlorine solution.

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*Rules for rounding off numerical values (*revised*).
†Code for hygienic conditions for food processing units (*first revision*).

3.2 Processing Requirements

3.2.1 The eggs, before breaking, shall be properly washed, dried and cooled, if necessary.

3.2.2 Glucose present in the liquid contents of original eggs shall be removed before drying.

3.2.3 The liquid contents of the eggs shall be pasteurized by heating for 5 minutes at 61 to 62°C in a plate type pasteurizer or by any other suitable method.

3.3 Requirements of the Finished Product

3.3.1 The egg powder shall have a uniform yellow or orange-yellow colour and a smooth and uniform texture, and shall be free from lumps and gritty material.

3.3.2 Egg powder shall retain the original properties of fresh egg, like solubility of protein, aerating capacity, binding power and palatability. Egg powder shall reconstitute readily and quickly when it is mixed with three times its mass of lukewarm water (about 40°C), after a preliminary mixing to form a smooth paste. On reconstitution, the egg powder shall be free from unpleasant off-flavours.

3.3.3 Egg powder may contain added carotene and riboflavin.

3.3.4 Egg powder shall be free from discoloration, added preservatives, artificial colouring matter and pathogenic micro-organisms, and other extraneous matter.

3.3.5 The product shall also comply with the chemical and microbiological requirements given in Table 1.

4. PACKING AND MARKING

4.1 Packing

4.1.1 Egg powder shall be gas packed in nitrogen (or nitrogen and carbon dioxide) in suitable tinplate or flexible containers.

4.1.2 *Packing in Cases* — The containers shall be packed in suitable cases. The number of containers in each case shall be subject to agreement between the purchaser and the packer.

4.2 Marking — The containers shall be marked either by printing or lithographing on the containers themselves or by attaching labels printed on paper as agreed between the purchaser and the vendor. The marking or the label shall give the following information:

a) Name of the material along with brand name, if any;

b) Name and address of the manufacturer;

TABLE 1 REQUIREMENTS FOR EGG POWDER

(*Clause* 3.3.5)

Sl No.	Characteristic	Requirement	Method of Test, Ref to	
			Appendix of This Standard	Other Standards
(1)	(2)	(3)	(4)	(5)
i)	Moisture content, percent by mass, *Max*	2 0	A	-
ii)	Protein (N × 6·68), percent by mass, *Min*	45·0	—	IS : 7219-1973*
iii)	Lecithin and fat, percent by mass, *Min*	40 0	B	—
iv)	Solubility, percent by mass, *Min*	85·0	C	—
v)	oric acid	Absent	—	Cl 23.1 of IS : 1479 (Part II)-1961†
vi)	Organic phosphorous pentoxide (P_2O_5), percent by mass, *Min*	1·25	—	Cl 19 of IS : 1479 (Part II)-1961†
vii)	Total ash, percent by mass, *Max*	3·6	—	Appendix E of IS : 1547-1968‡
viii)	Ash insoluble in hydrochloric acid, percent by mass, *Max*	0 10	—	Appendix F of IS : 1547-1968‡
ix)	Oxygen content, percent by mass, *Max*	2·0	D	—
x)	Total plate count, per gram, *Max*	75 000	—	IS : 5402-1969§
xi)	Yeast and mould count, per gram, *Max*	50	—	IS : 5403-1969‖
xii)	Coliform count, per gram, *Max*	100	—	IS : 5401-1969¶
xiii)	*Salmonella*	Absent	—	IS : 5887(Part II)-1976**

*Method for determination of protein in foods and feeds.
†Methods of test for dairy industry: Part II Chemical analysis of milk.
‡Specification for infant milk foods (*first revision*).
§Method for plate count of bacteria in foodstuffs.
‖Method for yeast and mould count of foodstuffs.
¶Methods for detection and estimation of coliform bacteria in foodstuffs.
**Methods for detection of bacteria responsible for food poisoning: Part III Isolation and identification of *Salmonella* and *Shigella*.

c) Net mass of the contents,

d) Batch number or code number;

e) Names of the ingredients,

f) Licence number given by the health authorities, and

g) Other requirements as per the Weights and Measures (Packaged Commodities) Rules, 1977

4.2.1 Each container may also be marked with the ISI Certification Mark

NOTE — The use of the ISI Certification Mark is governed by the provisions of the Indian Standards Institution (Certification Marks) Act and the Rules and Regulations made thereunder. The ISI mark on products covered by an Indian Standard conveys the assurance that they have been produced to comply with the requirements of that standard under a well-defined system of inspection, testing and quality control which is devised and supervised by ISI and operated by the producer ISI marked products are also continuously checked by ISI for conformity to that standard as a further safeguard Details of conditions under which a licence for the use of the ISI Certification Mark may be granted to manufacturers or processors, may be obtained from the Indian Standards Institution

5. SAMPLING

5.1 The method of drawing representative samples of the material and the criteria for conformity shall be as prescribed in Appendix E.

6. TESTS

6.1 Tests shall be carried out as prescribed in the appropriate appendices given under col 4 of Table 1

6.2 Quality of Reagents — Unless specified otherwise, pure chemicals shall be employed in tests and distilled water (*see* IS : 1070-1977*) shall be used where the use of water as a reagent is intended.

NOTE — ' Pure chemicals ' shall mean chemicals that do not contain impurities which affect the results of analysis

6.3 Preparation of Sample for Microbiological Tests — Weigh 11 g of the material from the individual sample using a sterile spatula and suspend in 99 ml of dilution water at 45°C. Agitate mildly, soak for 1 to 3 minutes and then agitate vigorously to avoid churning out the fat. Prepare dilutions of this and add 1 ml of suitable dilutions in triplicate to the sterile petri dishes.

*Specification for water for general laboratory use (*second revision*)

APPENDIX A

[*Table* 1, *Item* (i)]

DETERMINATION OF MOISTURE CONTENT

A-1. APPARATUS

A-1.1 Flat-Bottom Dishes — of glass or aluminium and with cover. Dishes should not be affected by boiling water. They may be 7 to 8 cm in diameter and not more than 2·5 cm deep. They should be provided with short glass stirring rods having a widening flat end.

A-1.2 Well-Ventilated Oven — maintained at 100 ± 2°C.

A-2. PROCEDURE

A-2.1 Weigh accurately about 5 g of the sample, into a flat-bottom glass or aluminium dish (with a cover) previously dried and weighed. Heat the dish containing the material after uncovering in an oven maintained at 100 ± 2°C for about 5 hours. Cool in a desiccator and weigh with the cover on. Repeat the process of drying, cooling and weighing at half hourly intervals, until the difference between two consecutive weighings is less than 2 mg. Record the lowest mass.

A-3. CALCULATION

A-3.1 Moisture content, percent by mass $= \frac{100\,(M_1 - M_2)}{(M_1 - M)}$

where

M_1 = mass in g of sample with the dish,
M_2 = mass in g of dried sample with the dish, and
M = mass in g of empty dish.

APPENDIX B

[*Table* 1, *Item* (iii)]

DETERMINATION OF LECITHIN AND FAT

B-1. APPARATUS

B-1.1 Soxhlet Extractor

B-2. REAGENT

B-2.1 Chloroform

B-3. PROCEDURE

B-3.1 Weigh accurately about 2 g of the sample into the folds of a filter paper (Whatman No. 4 or equivalent) and extract with chloroform for 16 hours in a Soxhlet extractor. Disconnect the tared Soxhlet flask, distil off the chloroform completely and weigh the flask with the residue (lecithin and fat).

B-4. CALCULATION

B-4.1 Lecithin and fat, percent by mass $= \frac{100\ (M_2 - M)}{M_1}$

where

M_2 = mass in g of the residue with Soxhlet flask

M = mass in g of empty Soxhlet flask, and

M_1 = mass in g of sample.

APPENDIX C

[*Table* 1, *Item* (iv)]

DETERMINATION OF SOLUBILITY

C-1. PROCEDURE

C-1.1 Weigh accurately $1{\cdot}0 \pm 0{\cdot}1$ g of the sample in an ordinary test tube and add exactly 5 ml of 5 percent (*m/v*) sodium chloride. Close the tube with a rubber stopper and shake gently for 1 minute to dispense the powder. Set aside for 15 minutes and invert ten times. After 5 minutes, close with the index finger, the top of the convenient length of glass tubing (approx 2 mm bore) and invert the tubing under the top of the liquid rotated thoroughly. Open the top of the tube momentarily, close again and remove the tube from solution and wipe the outside of the tube. Transfer a drop of the liquid to the refractometer and read off the refractive index.

C-1.2 Determine the solubility index of the egg powder by refractometer (Haenni value) as follows:

$$\text{Haenni value} = (X - Y) \times 1\,000$$

where

X = refractive index of the sample solution, and

Y = refractive index of the solvent.

Calculate the solubility percentage from the Haenni value as follows:

$$\text{Log}_{10}\, y = 0{\cdot}445 + 0\,01\, x$$

where

y = Haenni value, and

x = percentage solubility in sodium chloride.

C-1.3 For the sake of convenience, the following table may be referred to for conversion of Haenni value to the solubility percentage

Haenni Value	*Solubility Percentage*
17	78 55
18	81 03
19	83·36
20	85 60
21	87 72
22	90 00
23	91·67
24	93 52
25	95·29
26	97 00
27	98 64
28	100 00

APPENDIX D

[*Table* 1, *Item* (ix)]

DETERMINATION OF OXYGEN CONTENT OF CONTAINERS

D-1. APPARATUS

D-1.1 A diagrammatic sketch of the recommended apparatus, as assembled, is shown in Fig. 1.

D-2. REAGENT

D-2.1 Pyrogallol or 1,2,4-Triacetoxybenzene — Either of these two absorption reagents may be used.

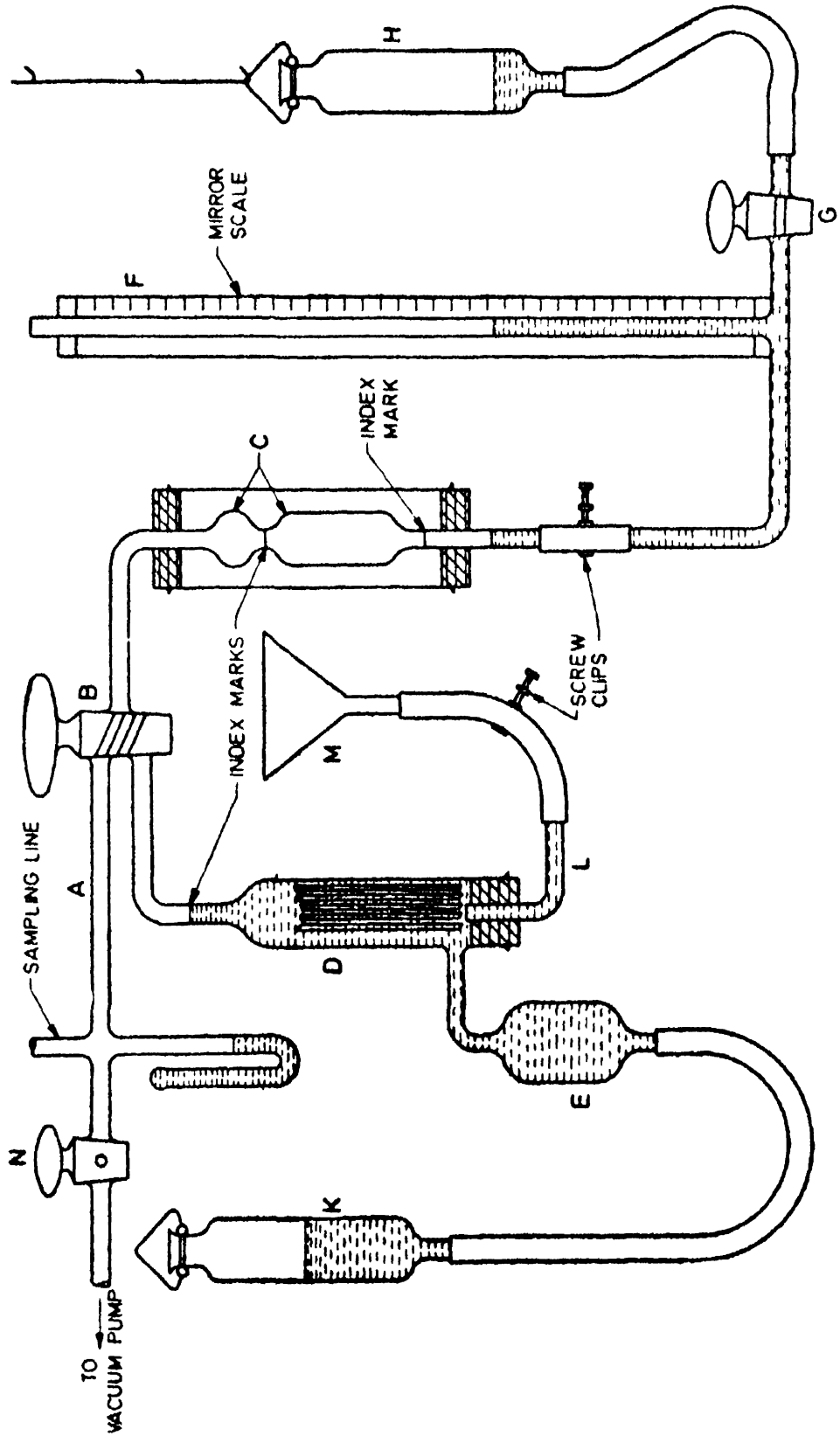

FIG. 1 DIAGRAMMATIC SKETCH OF OXYGEN ANALYSIS APPARATUS

D-2.1.1 Alkaline pyrogallol is prepared by mixing equal volumes of solutions of 25 g of pyrogallol in water to 100 ml and 100 g of potassium hydroxide in water to 100 ml, and kept in a well-stoppered bottle.

D-2.1.2 Alkaline 1,2,4-triacetoxybenzene is prepared by dissolving 10 g of 1,2,4-triacetoxybenzene by gentle warming with a solution of 13·5 g of potassium hydroxide in 100 ml of water.

D-3. PROCEDURE

D-3.1 With the sampling tool resting on but not piercing the can or container, and with stopcock *B* closed and stopcock *N* open, evaquate the sampling line to 5 mmHg or less, as indicated on the manometer; close stopcock *N*, and if there is no leak in the sampling line the manometer level does not change. (If the level changes, indicating a leak, this is rectified and the line is re-evacuated.) With *N* closed, pierce the can or container when the mercury in the manometer flows back with a click. Keeping stopcock *G* open and reservoir *H* on the lowest hook, turn stopcock *B* to allow gas from the sampling line and can or container to flow into *C* until one or both bulbs are full of gas. Close stopcock *B*, stir the water in the jacket and note its temperature (T°C). Bring the level of mercury in *C* to the appropriate index mark by closing *G* and operating the screw clip. Then take the manometer reading (S_1). Hang reservoir *H* on the topmost hook, open stopcock *G* and turn stopcock *B* to pass the gas into the absorption chamber. By raising and lowering *H*, the gas is passed to and fro the requisite number of times. When absorption is complete bring the reagent level to the mark, approximately by moving reservoir *H*, then exactly by closing *G* and operating the screw clip. Close stopcock *B*, open stopcock *G*, and adjust the mercury level in the measuring bulb to the appropriate mark as before. Note the manometer reading (S_2), and read the thermometer. (There shall be no temperature change during the estimation; any change will cause serious errors if not allowed for in the calculation.) Finally discharge, the gas remaining in the measuring bulbs *C* by raising *H*, opening *G*, and turning *B* to allow the gas to flow out through the sampling line, following up with mercury until the upper bore of *B* is full.

D-4. CALCULATION

D-4.1 Oxygen, percent by mass $= \dfrac{S_1 - S_2}{B - W - P + S_1} \times 100$

where

S_1 = manometer reading with sample at index mark before absorption,

S_2 = manometer reading with sample at index mark after absorption,

B = barometric pressure,

W = aqueous vapour pressure at water jacket temperature (T°C), and

P = manometer reading corresponding to index mark at atmospheric pressure (P_1 or P_2 as appropriate).

NOTE — If the oxygen content is low (under 5 percent), the barometric pressure may be assumed to be 76 0 cmHg and W to be 1 5 (corresponding to 18°C). If in addition S_1 is about the same as $P + 0\ 2$ cmHg, the denominator may be assumed to be 75 0 in all cases without affecting the accuracy of the result to the first decimal place

Then the expression becomes

$$\text{Oxygen, percent by mass} = \frac{(S_1 - S_2)}{75} \times 100 = 4\ 3\ (S_1 - S_2)$$

which gives sufficient accuracy for factory control purposes

APPENDIX E

(*Clause* 5.1)

SAMPLING OF EGG POWDER

E-1. GENERAL REQUIREMENTS

E-1.0 In drawing, preparing, storing and handling samples, the following precautions and directions shall be observed

E-1.1 Samples shall be taken in a protected place not exposed to damp air, dust or soot.

E-1.2 The sampling instrument shall be clean and dry when used. When taking samples for bacteriological examination it shall be sterile.

E-1.3 Precautions shall be taken to protect the samples, the material being sampled, the sampling instrument, and the containers for sample from adventitious contamination

E-1.4 The samples shall be placed in clean and dry glass containers The sample containers shall be of such a size that they are almost completely filled by the sample. The sample containers shall, in addition, be sterile when they are used for samples for bacteriological examination.

E-1.5 Each container shall be sealed airtight after filling and marked with full details of sampling, batch or code number, name of the manufacturer and other important particulars of the consignment.

E-1.6 Samples shall be stored in such a manner that the temperature of the material does not vary unduly from the normal temperature.

E-2. SCALE OF SAMPLING

E-2.1 Lot — All the containers in a single consignment of one type of material drawn from a single batch of manufacture shall constitute a lot. If the consignment is declared to consist of different batches of manufacture, the batches shall be marked separately and the group of containers in each batch shall constitute separate lots.

E-2.1.1 Sample shall be tested from each lot for ascertaining its conformity to the requirements of this standard.

E-2.2 The number of containers to be selected from the lot shall depend on the size of the lot and shall be as given in Table 2.

E-2.3 The containers shall be chosen at random from the lot and for this purpose a random number table (*see* IS : 4905-1968*) as agreed between the purchaser and the supplier shall be used. If such table is not available, the following procedure shall be adopted.

Starting from any container, in the lot, count them as 1, 2, 3..., up to r in a systematic manner, where r is equal to the integral part of N/n, N being the total number of containers in the lot, and n the number of containers to be chosen (*see* Table 2). Every rth container thus counted shall be separated until the requisite number of containers is obtained from the lot to give samples for test.

TABLE 2 NUMBER OF CONTAINERS TO BE SELECTED FOR SAMPLING

(*Clauses* E-2.2, E-2 3 *and* E-3.3)

Lot Size	Sample Size (for Tests Other Than Microbiological)	Sub-sample Size (for Microbiological Tests)
(1)	(2)	(3)
2 to 25	2	1
26 ,, 100	3	1
101 ,, 300	5	2
301 ,, 500	7	3
501 and above	9	4

*Methods for random sampling.

E-3. TEST SAMPLES AND REFEREE SAMPLES

E-3.1 Preparation of Individual Sample — Draw with a suitable sampling instrument approximately equal quantities of the material from different parts of the container till the quantity collected is about 500 g and divide it into three equal parts Each part so obtained shall constitute a sample representing the container and shall be transferred immediately to thoroughly clean and dry containers sealed airtight with particulars given under **E-1.5** The individual sample so obtained shall be divided into three sets in such a way that each set has a sample, representing each selected container. One of these shall be marked for the purchaser, another for the vendor and the third for the referee

E-3.2 Preparation of Composite Sample — From the material from each selected container, remaining after the individual sample has been taken, approximately equal quantities of the material shall be taken and mixed together so as to form a composite sample weighing about 600 g. This composite sample shall be divided into three equal parts and transferred to clean and dry containers sealed airtight and labelled with the particulars given in **E-1.5.** One of these composite samples shall be for the purchaser, another for the vendor and the third for the referee.

E-3.3 Preparation of Samples for Microbiological Examination — From the selected container select a sub-sample according to col 3 of Table 2. Draw with a suitable sampling instrument, which is sterile, at least 100 g of the material and mix thoroughly under aseptic conditions to form a sample for microbiological examination. Divide the sample (taking care not to bring in microbiological contamination in the material) into three equal parts Each part so obtained shall constitute a sample representing the parts. Each part so obtained shall constitute a sample representing the container and shall be transferred to sterile glass containers sealed, airtight and labelled with particulars given in **E-1.5.** They shall be marked, in addition, with the words 'For Microbiological Examination' The samples so obtained shall be divided into three sets in such a way that each set has a sample representing each selected container One of these sets shall be marked for the purchaser, another for the vendor and the third for the reference.

E-3.4 Referee Samples — Referee samples shall consist of a set of individual samples (**E-3.1**) and a composite sample (**E-3.2**) and set of samples for microbiological examination (**E-3.3**) marked for this purpose and shall bear the seals of the purchaser and the vendor. These shall be kept at a place as agreed between the two.

E-4. NUMBER OF TESTS

E-4.1 Tests for description, moisture, protein, lecithin and fat, boric acid, organic P_2O_5, ash insoluble in hydrochloric acid, total ash and solubility shall be conducted on each of the samples constituting a set of individual samples.

E-4.2 Tests for bacterial count, yeast and mould count, coliform count and *Salmonella* shall be conducted on each of the samples meant for 'microbiological examination'.

E-4.3 Test for oxygen content shall be conducted on the composite sample.

E-5. CRITERIA FOR CONFORMITY

E-5.1 The lot shall be declared as conforming to all the requirements of this specification when **E-5.1.1** to **E-5.1.3** are satisfied.

E-5.1.1 The test results on each of the individual samples for description, moisture, protein, lecithin and fat, boric acid, organic P_2O_5, ash insoluble in hydrochloric acid total ash, and solubility shall satisfy the corresponding requirement given in **3.3.1** to **3.3.4** and in Table 1.

E-5.1.2 The test results for bacterial count, yeast and mould count, coliform count and *Salmonella* shall satisfy the corresponding requirement as given in Table 1.

E-5.1.3 The test results on the composite sample for the characteristic mentioned in **E-4.3** shall satisfy the corresponding requirement as specified in Table 1.

INTERNATIONAL SYSTEM OF UNITS (SI UNITS)

Base Units

Quantity	Unit	Symbol
Length	metre	m
Mass	kilogram	kg
Time	second	s
Electric current	ampere	A
Thermodynamic temperature	kelvin	K
Luminous intensity	candela	cd
Amount of substance	mole	mol

Supplementary Units

Quantity	Unit	Symbol
Plane angle	radian	rad
Solid angle	steradian	sr

Derived Units

Quantity	Unit	Symbol	Conversion
Force	newton	N	1 N = 0 101 972 kgf
Energy	joule	J	1 J = 1 N m
Power	watt	W	1 W = 1 J/s
Flux	weber	Wb	1 Wb = 1 V s
Flux density	tesla	T	1 T = 1 Wb/m^2
Frequency	hertz	Hz	1 Hz = 1 c/s (s^{-1})
Electric conductance	siemens	S	1 S = 1 A/V
Pressure, stress	pascal	Pa	1 Pa = 1 N/m^2

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